U.S.Forensic
Engineering • Inspection • Failure Analysis

USF Report No. 12.22.1304

Building Damage Evaluation

Location of Loss:
Ramey Residential Building
24 Michigan Street
Long Beach, New York 11561-1309

Claim No. 12-13381

Prepared for:
Fidelity National Property and Casualty Insurance Company
P.O. Box 33064
St. Petersburg, Florida 33733-8064

Prepared by:
U.S. Forensic, LLC
3300 West Esplanade Avenue, Suite 601
Metairie, Louisiana 70002

Engineer of Record:
George Hernemar, P.E.
New York Registration No. 088718

EXHIBIT
4

Raimey- US Forensic, Hernemar 209
(Raimey Order 11-07-14)

Table of Contents

Results and Conclusions

Based upon the information obtained and considered to date, we offer the following opinions:

1) The physical evidence observed at the property indicated that the subject building was not structurally damaged by hydrodynamic forces, hydrostatic forces, scour or erosion of the supporting soils, or buoyancy forces of the floodwaters associated with the subject flood event.

2) The physical evidence observed at the subject property indicated that the uneven roof slopes, leaning exterior walls and the uneven floor surfaces within the interior of the building, were the result of long term differential movement of the building and foundation that was caused by long-term differential movement of the supporting soils at the site and long-term deflection of the building framing.

Introduction

Ms. Deborah Ramey reported that the residential building located at 24 Michigan Street in Long Beach, New York, was damaged by floodwaters that inundated the property on October 29, 2012 in connection with the passage of Hurricane Sandy. The specific damage reported was that the floodwaters caused displacement of the floor framing and uneven floor surfaces within the building.

U.S. Forensic, LLC (U.S. Forensic) was retained by Fidelity National Property & Casualty Insurance Company to perform an evaluation of the building and to determine the cause and extent of the reported damage. Our work to complete this assignment was performed by George Hernemar, P.E. and Ms. Deborah Ram was present during the inspection and provided information pertaining to the building. All measurements and data cited in this report are considered to be approximate values.

Background Information

Ms. Deborah Ramey reported that the building was constructed in 1938 and that she purchased the property 7 years ago. Ms. Deborah Ramey reported that for 2 years ago, the entire kitchen was renovated and that new floor coverings were installed in the living room.

Ms. Deborah Ramey reported on October 29, 2012 floodwater in connection with the passage of Hurricane Sandy affected the property. Ms. Ramey stated that floodwaters inundated the property, entered the crawlspace and interior living areas of the building and rose approximately 36 inches above the floor surface. Ms. Ramey reported that after the floodwaters receded, she noticed that the floor surfaces within the interior of the building and the roof slopes above the building were uneven and that soil was deposited around the perimeter of the foundation. Ms. Ramey stated that no structural repairs were performed to the building prior to our inspection.

Site Observations

The subject building was a 1.5-story, wood framed, 1-family dwelling structure supported on a pier-and-beam foundation system with interior piers and perimeter foundation walls constructed of concrete masonry unit (CMU) blocks.

The exterior walls of the building were covered with horizontally lapped vinyl siding and the gable-style roof was covered with asphalt composite shingles. For the purpose of this report, the front of the building was referenced to face west.

The topography of the property was flat. An approximately 1.5 feet deep layer of waterborne sand surrounded the building. High water marks were observed on all sides of the building that were measured to be approximately 36 inches above the ground surface. No soil voids from recently scoured soils were observed along the perimeter of the building or at the property.

On the exterior of the building, no scuff marks gouges or any other evidence of impacts from waterborne debris was noted. We measured the exterior walls of

the building for verticality using a carpenter's level. The measurements taken indicated that the entire south wall was leaning outward approximately 1.6 inches over a height of 4 feet, the entire north wall was leaning inward approximately 1.6 inches over a height of 4 feet, the entire west wall was leaning outward approximately 1.1 inches over a height of 4 feet and that the. The entire east wall was leaning inward approximately 1.1 inches over a height of 4 feet. Some unevenness of the roof slopes was noted but no evidence of any recent shifting or movement of the exterior walls of the building was noted.

Within the crawlspace area beneath the building, no vapor retarder covered the ground surfaces and the exposed soil was soft, wet and uneven. Deposits of waterborne debris were noted on the underside of the floor framing and the floor insulation was matted and fallen. No scoured soils were observed around any of the foundation piers, foundation walls or anywhere else beneath the building. No scuff marks, coloration differences or any other evidence of recent shifting or movement of the building framing or foundation components was observed beneath the building.

Within the interior living area of the building, high water marks on the inside of the building were visible on various wall surfaces that were measured to be approximately 6 inches above the floor. Approximately half of the living room floor closest to the west wall yielded noticeably when walking on it. We noted a localized high ridge in the floor near central portions of the living room that was oriented parallel to the west wall. We performed relative elevation measurements of the floor surfaces within the interior living area of the building using an electronic relative elevation measuring device. The measured elevations of the floor along the south wall ranged from 2.7 inches below (in the south-east corner of the building) to 3.5 inches below the reference point in the middle of the building. The measured elevations of the floor along the north wall ranged from 1.7 inches (in the north-west corner of the building) below the reference point in the middle of the building to 1.4 inches above (in the middle of the north wall) the same reference point. The floor elevations can be characterized as sloping downward from northeast towards the southwest.

Weather Information

The National Weather Service reported that Hurricane Sandy made landfall at approximately midnight on October 29, 2012, near Atlantic City, New Jersey as a Category I hurricane. Significant storm surge and flooding were reported along a long stretch of the Mid-Atlantic and Southern New England coast.

Available weather information indicated that the maximum sustained winds in the area of 56 mph during the storm, that the maximum wind gusts of 85 mph and that 0.55 inches of rainfall was recorded at New York JFK, New York on October 29, 2012. Storm surge of 9.4 feet reportedly affected Rockaway, New York area during the passage of the storm.

Foundation Soils Information

The soils information available from the NRCS web soil survey indicated that the subject building was constructed on Urban Land soils. Urban land soils were described as various quantities of miscellaneous soil constituents and fill materials placed at the site and no engineering properties or characteristics were available for the soil due to the inconsistency of the material.

Analyses and Discussion

Available information indicated that Long Beach, New York area experienced flooding on October 29, 2012 in connection with the passage of Hurricane Sandy. High water marks observed at the site indicated that floodwaters inundated the property, entered the crawlspace and interior living area of the building and rose approximately 6 inches above the floor surface. No scoured soils were observed at the property but waterborne deposits of sand were noted around the perimeter of the building. The evidence observed at the site indicated that the property experienced depth and velocity flow of floodwaters during the subject flood event.

Flowing floodwaters generally exert greater forces on surfaces and structures than still waters of similar depth. Moving water flowing around a structure imparts lateral and vertical forces to the structure associated with the weight of the water (hydrostatic and buoyant forces), lateral impact forces associated with the momentum of the moving water (hydrodynamic forces), and frictional forces along the surfaces contacted by the moving water that can scour and erode adjacent soils and remove wall coverings and appurtenances. Hydrostatic and hydrodynamic forces can damage elements of a building structure and erosion and scour caused by the frictional forces can weaken the structure by removing supporting soil and undermining the building foundation. Differential floodwater levels acting against the walls of the building, either from the exterior during the initial flooding of the property or trapped within the interior of the building when the exterior floodwaters recede, exert hydrostatic pressures upon the building.

We observed no evidence or indications of recent movement, distortion or shifting of the exterior walls of the subject building consistent with the application of hydrodynamic forces or hydrostatic forces from floodwaters. We also observed no scuff marks, abrasions, or other evidence on or around the subject building to indicate impact or recent shifting or movement of the building framing or foundation. We did not observe any erosion or scour of the soils around the perimeter of the subject building or in the crawlspace consistent with detrimental velocity flow. No evidence of recent shifting or movement of the floor framing members or foundation components was observed beneath the subject building. The physical evidence observed at the property indicated that the subject building and foundation system were not structurally damaged by hydrodynamic forces, hydrostatic forces, scour or erosion of the surface soils, or buoyancy forces of the floodwaters associated with the reported flood event.

On the exterior of the building, the roof was noted to be uneven and the walls were measured to be leaning but no evidence of any recent shifting or movement of the exterior walls or roof framing was noted. Within the crawlspace area

beneath the building, no scoured soils were observed and no scuff marks, coloration differences or any other evidence of recent shifting or movement of the floor framing or foundation components was noted. Within the interior of the building the floors were measured to be uneven and sloped downwards towards the southwest corner of the building but no evidence of any recent shifting or movement of the interior walls or ceilings was observed. The noted conditions at the site including the uneven roof slopes, leaning exterior walls and the uneven floor surfaces within the interior of the building, were consistent with differential movement of the building and foundation.

Differential movement of a building and foundation is a common occurrence that may be caused by movement of the supporting soils at the property, deterioration and distortion of the framing components of the building, re-leveling, and other repair efforts. Movement of the supporting soil beneath the foundation system is typically caused by long-term reduction of the soil volume in response to loads imparted to the ground (consolidation), changes in soil moisture content, subsidence, and frost heave from subfreezing temperatures. Causes of variations in the soil moisture include intermittent periods of rainfall, flooding, poor drainage around a structure, variation in watering of vegetation, the presence of trees and shrubbery that consume soil moisture, and the presence of leaks in plumbing lines at or near the property.

Representative photographs are in the attachments. The photographs taken but not included in the report are available upon request.

This report was prepared by U.S. Forensic, L.L.C. for the exclusive use of Fidelity National Property & Casualty Insurance Company. Any other use is prohibited without the written consent of Fidelity National Property &Casualty Insurance Company and U.S. Forensic. Our opinions are based on experience, education, work performed, industry resources, engineering references, and other information acquired and listed in the **Reference Information** section of this report. We reserve the right to modify or supplement our opinions and conclusions.

Reference Information

We reviewed and utilized the following references and information when preparing this report.

1) Site inspection of the building located at 24 Michigan Street in Long Beach, New York performed on December 4, 2012 by George Hernemar, P.E. Photographs and measurements were taken in various portions of the building.

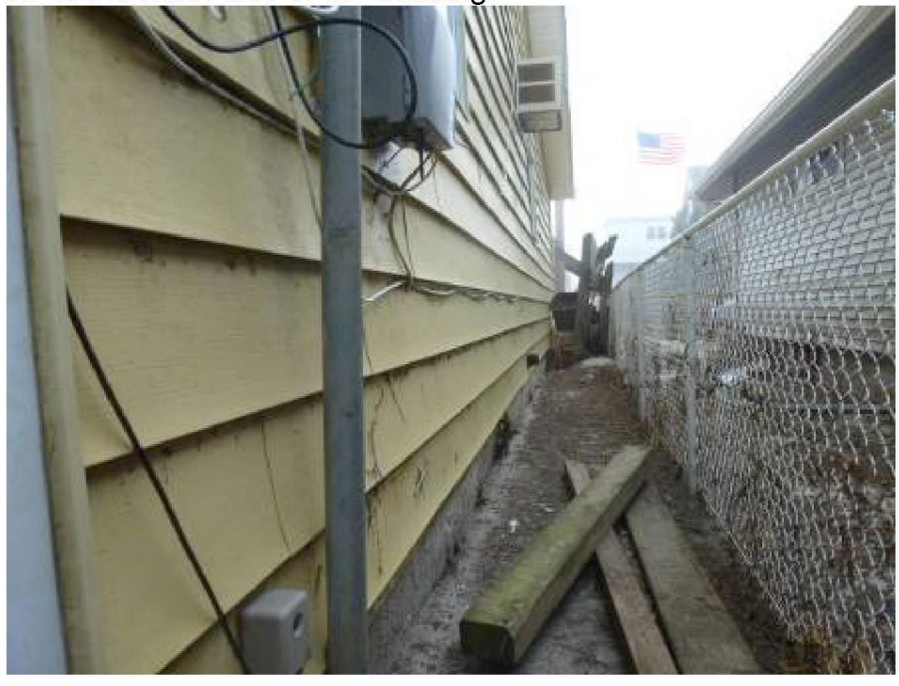
2) NRCS Soil Conservation Service Web Soil Survey for Nassau County, New York.

3) Weather data from the WeatherUnderground.com website.

Photographs

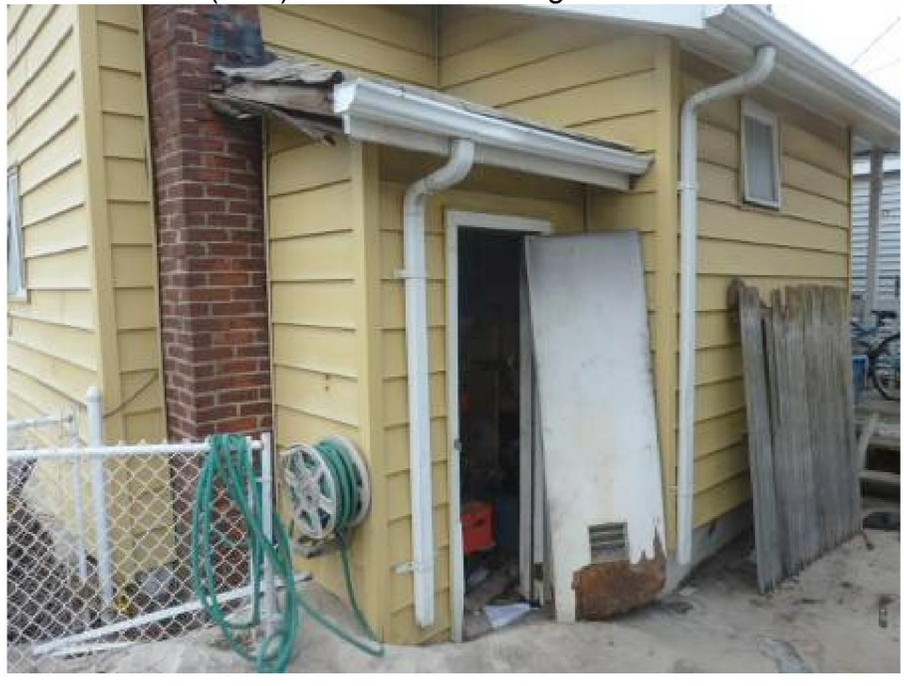
Photograph 1
View of the front (west) side of the subject building.

Photograph 2
View of the north side of the building.



Photograph 3
View of the south side of the building.

Photograph 4
View of the rear (east) side of the building.



Photograph 5
View of the south-west corner of the building. Note the waterborne deposits of sand.

Photograph 6
View of the south-west corner of the building.

Photograph 7
View of the south-east corner of the building.

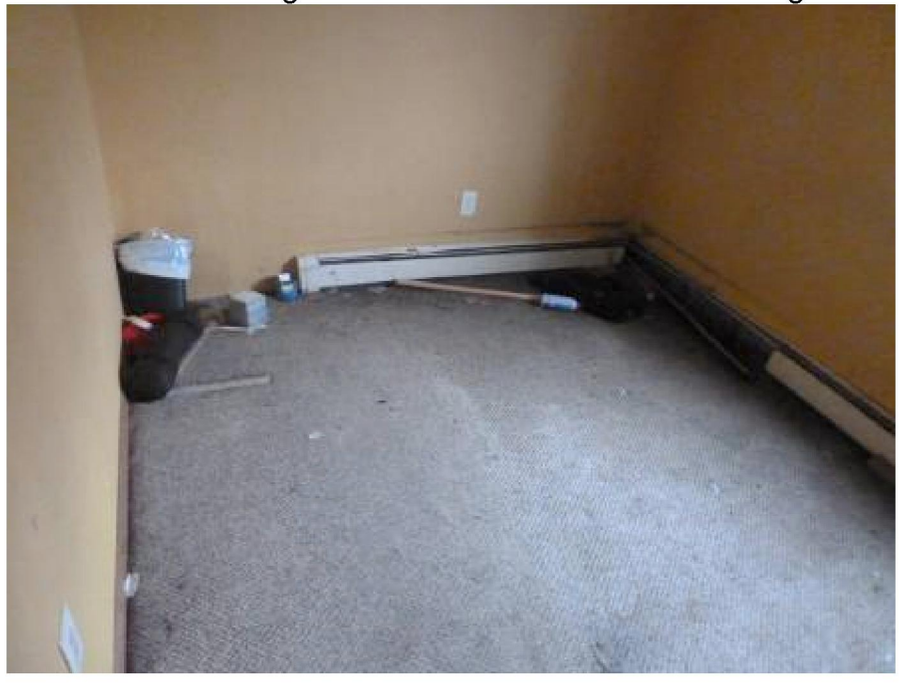
Photograph 8
View of the south wall of the building.

Photograph 9
View of high water marks on northeast corner of the building.

Photograph 10
View of main entrance door with high water marks as seen from inside. Note the sand on the floor.

Photograph 11
View of wall in kitchen.

Photograph 12
View of bedroom along south and east walls of the building.



Photograph 13
View of southwest corner of the building.

Photograph 14
View of living room with sand deposited by the recent flood event.

Photograph 15
View of noticeably leaning floor in living room.

Photograph 16
View of crawlspace as seen from north-east.

Photograph 17
View of crawlspace as seen from north-east.

Photograph 18
View of crawlspace as seen from north-east.